



Transcript: #409 How to Customize Your Weight Loss Based on Your Genetics with Dr. Sam Shay

Wendy Myers:

Hello, I'm Wendy Myers. Welcome to the *Myers Detox Podcast*, where we talk about everything related to heavy metal and chemical detoxification, and how toxins impact your life and your health. Today, we're talking with Dr. Sam Shay about how genetics impact your weight loss and how you can get your genetic panel run to figure out what type of genes you have for weight loss. There's three different types. I want to talk about those three different types on the show today. Dr. Sam Shay is really, really good.

Wendy Myers:

He's articulated this issue of weight loss in your genetics exceptionally well, better than any guest, I think, I've ever had on the show. You need to watch this if you are struggling with your weight, your hormones, addictions, eating and overeating. There are so many pearls of wisdom on this show today. We're going to be talking about the type of genetic tests that you need to determine your weight loss, what type of genetic tests that you can get to know how many carbs you can eat or what level of carbs you should be eating.

Wendy Myers:

We'll also talk about how your liver's instrumental in metabolizing your excess hormones. We'll talk about how your hormones are causing weight gain, if inflammation is a bigger contributor to your weight gain and a lot of different solutions to every different type of genetic weight issue that people can have. Some people have all three of them. Some people have one. Some people have two. We talk about how exercise or over-exercise can actually cause more weight gain, and how what genetic type that you are that will cause that issue.

Wendy Myers:

We'll also talk about how if you don't tend to gain weight at all, if you eat your food and you just burn it all off, toxins that you eat then go into your brain and your central nervous system and can really have a much more dramatic impact on you than if you are able to store them in fat, if you did retain fat. We'll discuss

how fat actually has a protective effect on you. We'll talk about all those issues and more and how you can really get to the bottom of the underlying root cause of your weight gain or resistant weight loss on the show today.

Wendy Myers: I know some of you listening are concerned about toxins. You're concerned about how to detox your body, what toxins that you have and what testing you should do. That's why I created a two-minute quiz that you can take at heavymetalsquiz.com. It only takes a couple of minutes and you'll get your results like your general body burden of toxins and the levels of toxins you have in your body. You'll get a free video series that answers a lot of your frequently asked questions about how to detox your body, what tests you should do, what supplements are good for detoxification? There is lots of really good information.

Wendy Myers: You can take the quiz at heavymetalsquiz.com. Our guest today, Dr. Sam Shay, is a DC and a graduate of IFM. He helps busy health-conscious entrepreneurs and mompreneurs attain and sustain high performance, so that they can create more freedom for themselves and others. He's dedicated his life to helping others through functional medicine and functional genetics. Dr. Shay walked his own health journey from being chronically unwell from age six to 18, including severe fatigue, anxiety, digestive problems, chronic pain, severe insomnia and poor nutrition.

Wendy Myers: He dedicated his life to natural medicine to get himself and others well. This has led him to functional medicine and functional testing, including genetics. Dr. Shay has recently authored a new ebook on genetics, where you can learn the different types of genetic-based weight gain, how to future-proof your brain, food triggers, and how to genetically determine your optimal carb tolerance, vitamin D absorption, and immunity support.

Wendy Myers: You can get your free copy at drsamshay.com/genetics. You can learn more about Dr. Shay and his work at drsamshay.com. Dr. Shay, thank you so much for coming on the show.

Dr. Sam Shay: Thanks for having me. I really appreciate it.

Wendy Myers: Why don't you tell us a little bit about yourself and how you got involved in functional medicine and especially genetics?

Dr. Sam Shay: Sure. My background is a very common narrative for a lot of people who get involved in functional medicine, that they got sick with something or struggled with something, or they watched a dear family or friend go through it. Through that tremendous amount of pain, they tried all these different solutions and then found the collective solutions known as functional medicine. That's the short version. The slightly longer one is that both my parents were medical doctors and they had a really bad nuclear divorce.

Dr. Sam Shay: Me and my sisters were caught in that blast radius. I was six years old, and that was the pivotal moment in my life where I developed severe, deep, crushing insomnia for over 10 years. At home I had really bad digestive issues, anxiety, depression and two addictions, one to video games and one to sugar. At school, it was an emotional war zone. On top of what was happening at home, it was kind of a physical war zone where I was assaulted a lot. The school never did what it should have, which is to intervene, stop and protect the smaller students amongst them.

Dr. Sam Shay: I had such bad insomnia that actually stunted my growth such that the biggest growth years for me were six to 18. I remember lying to my school teachers saying that I felt sick, because I'd feel so tired in the afternoon. I was falling asleep on my desk at 2:00 or 3:00 PM. I now know why, from all the work and understanding of circadian rhythms and adrenal rhythms and so on. Of course, back then in second grade, I didn't know any better. I just felt so tired. I couldn't keep my eyes open, so I would lie and say I felt sick just to go down to the nurse's office to take a nap.

Dr. Sam Shay: Basically, when I was a teenager, I made a decision that I had to get myself better or I was going to do something rash. I found Dr. Jensen's guide to better bowel care. He's considered the grandfather of Western naturopathy at least in the States. Then, through the help of a coach and later a mentor named Eliza, she did what was called brain gym with me, which is a form of mind/body kinesiology. I learned from her that it is possible to change the body to change the mind and to change the mind to change the body. There was a two-way direction, there was empowerment there.

Dr. Sam Shay: I wasn't just a victim of my own body. I remember waking up, the contrast was quite stark, at 3:00 AM on the dot like I would for 10 years. Before I met her, just waking up in this silent rage at my body, hating it, hating my body. Like, "What do you want from me? What do you want from me? What do you want?" I mean, it sounds a bit harsh, but it was like an abusive relationship. I'd be punished. My perception was my body would punish me for a crime I didn't know I was committing.

Dr. Sam Shay: I'd be punished and punished, and then randomly, I'd feel good. It's like it was gas lit. Then suddenly, my body would punish me again, and I just couldn't negotiate. I didn't know what to do except be punished and trapped in this relationship.

Wendy Myers: I think a lot of people suffer from self-hatred with their body and health-PTSD and things like that. So many struggle with that.

Dr. Sam Shay: It's very common. It's not even just self-hatred like this combative relationship with the body. There's also a tremendous amount of shame, a tremendous

amount of shame like, "What's wrong with me? Everyone else seems to be doing fine." I mean, at some point, when I was growing up, I was like, "Clearly, this is all my fault, because everyone at school hates me. I get no support at home, and people are yelling and lying. My body is attacking me. Clearly, it's me, because there's no feedback that it's not me even from my own body."

Dr. Sam Shay: That was formative, that experience. Then thankfully, I started reading really good books on mind, body and natural medicine. I met Eliza, and I learned that the body's a partnership. It's not a combative relationship. Then I went into college and studied pre-med and then a holistic health practitioner degree in the evenings and weekends. Then just with the sole goal of trying to heal myself and also to become a doctor, but not a medical doctor anymore, a natural doctor. Then I went into chiropractic school and did two to three postgraduate seminars a month, for every month that I was still in school, starting right from the first trimester.

Dr. Sam Shay: I was taking well over 100 postdoc seminars by the time I finished school, on top of studying and going really deep into neurology, nutrition and lifestyle. Then when I was in New Zealand, I had a clinic out there for eight years. I also did acupuncture out there, got very heavy into functional medicine while I was in New Zealand, particularly focusing on adrenals, thyroid, mitochondria, gut and then later on genetics. The tie into genetics was that genetics was the missing piece in the functional medicine space.

Dr. Sam Shay: My favorite definition is, it's the best of Western medical diagnostics with the best of natural medicine and lifestyle interventions, so it is functional medicine. My definition of functional medicine is we use the best toys from Western science to get numbers, data, readouts, statistics and information. From that, we can then utilize all the wonderful hundreds and thousands of years of wisdom in terms of how to correct the body from lifestyle, diet, nutrition, and also use targeted supplements. Again, this estuary of Western science and natural medicine, to get someone better.

Dr. Sam Shay: What was missing in my life was the genetics component. Despite having radically improved my life, my health, changing my functional lab markers, improving my adrenals and all these things, I was still struggling with bad digestive problems and chronic joint pain. Now, I had joint pain like an old man, and it just didn't make any sense. Finally, I learned about genetics. I just took the seminar because it was recommended to me. I always like learning about things, and genetics is a thing, so I'm going to learn about a thing so here we go.

Dr. Sam Shay: I did the genetics testing on myself, and I found that I was eating the wrong diet for my genetics. I had a perfect Portlandia diet, Mediterranean, like I knew the names of the chickens. The quinoa was grown in the south island of New Zealand, picked by left-handed monks on a full moon, sung in low tones and high tones. The bags were airlifted by butterflies, whatever. It's just that I have

these perfect bags of quinoa soak sprouted, et cetera, and I was still having really bad digestive problems. Problems so bad I would empty a yoga room, or I'd be in pain.

Dr. Sam Shay: I didn't get it. I was eating so well. I was even teaching nutrition. What it turned out was that my Mediterranean-style diet was appropriate for me from a carb tolerance standpoint. I have the carb tolerance of an Eskimo or an Inuit, not the carb tolerance of someone that lives on the latitude of middle to Southern Europe. My ancestry came from Russia, the northern parts of Russia, so it makes sense that evolutionarily, there's not a lot of carbohydrates and the winter is an annual natural catastrophe.

Dr. Sam Shay: I have the second lowest carb tolerance you can have. People can have one to 20 copies of the specific gene that spits out amylase, and it's a linear thing. So if you've got one copy of this gene, you've got the lowest carb tolerance. If you've got 20, you can just plow through carbs with no problem. I had two. Within one week of changing my diet, my carb tolerance, my genetic set point, all my digestive problems for as long as I've ever been alive went away.

Wendy Myers: All you had to do was go carnivore.

Dr. Sam Shay: Well, not quite a carnivore. It was paleo bordering on keto. People who have one copy, they're pretty much keto, two copies are straddling keto and paleo. Threes and fours are really paleo. Five to eight are shades of gray of Mediterranean, and nine and above are shades of gray of higher carb or rather higher starch. There are high starch people out there. I've really changed my position on diet, because now we can genetically test. Now notice, I didn't say vegan or vegetarian or meat. I said carbs.

Dr. Sam Shay: It's harder to be low carb if you're vegan, but the primary thing we're looking at is carb tolerance. Whatever style or how you express that, it takes a lot of personal preferences and personal journeys and what people are comfortable with. That was the diet piece. The second piece was joint pain. I found in the other genetics profile that I had so many pro-inflammatory genes that all clustered together, that were the highest priority genes, because there's hundreds of thousands of genes to do with inflammation, but there's only 15 to 20 that are the super generals. The ones at the very, very, very top that control everything underneath it.

Dr. Sam Shay: I had the majority of those as negative variants. I was an avid over-inflamer, so any little thing would trigger inflammation, and it would sit in my joints. It wouldn't go to water retention, inflammatory water weight gain, like it does with a lot of other people. I have a different set of genes that control how my fat and water is distributed, but instead, all the inflammation went to my joints. When I learned that, she made the changes from within the genetics profile, more specifically what's called nutrigenomic dosing.

Dr. Sam Shay: It's getting into the weeds here, but nutrigenomic dosing is different from nutritional dosing. Nutrigenomic dosing is when people have genetic variants that they need much higher concentrations than what the RDA or what is normal dosing because genetically, they need more. I have a way higher need for fish oil, like six grams a day versus the one gram that most people are told to have. My joint pain has gone away and I didn't learn that from a functional test. I learned that from genetics testing.

Dr. Sam Shay: I learned about nutrigenomic testing from genetics, not from the functional. I love the functional. I still do all the functional testing, but they talk about different things. Genetics versus functional, those two things, there were other things as well. I found out I was genetically vulnerable to caffeine-induced anxiety and depression. There's a percentage of the population, which I'm one, that caffeine actually triggers anxiety and depression.

Dr. Sam Shay: It doesn't matter how Bulletproof my coffee is. I can put as much coconut oil or coconut milk, and I even put in licorice, cardamom, cinnamon, burdock, clove and turmeric.

Wendy Myers: Anything to make it work.

Dr. Sam Shay: I was trying to create this holistic self-righteous mochaccino Moroccan chai that I could justify having as my coffee. Look, it's a healthy food. It's not coffee. It's not a herbal delivery elixir. I was BS-ing myself, because I would still have that jittery-like, "Oh no, I'm just getting energized from all the herbs," and I'm like, "No, it wasn't caffeine-induced anxiety and depression," so I'm off of caffeine. Occasionally, I have some tea, but very light. I don't have caffeinated coffee anymore.

Dr. Sam Shay: There's a meaningful percentage of the population that has that. I've had my diet radically change from genetics in meaningful and effective ways. Also, systemic issues that I've had going on that I didn't find out if not for the genetics. It's not to the exclusion of all the other functional tests like mitochondria. They find other things. You asked me about genetics. Those are the big, big things that I found in genetics that for me personally, how I got into it.

Wendy Myers: Let's go back to that self-hatred for a minute, because there are so many women out there that deal with self-hatred when it comes to their weight and their body image and trouble losing weight. So many women struggle with that because they're missing that one last piece, which is the genetic piece.

Wendy Myers: They don't know what their genetics are. They haven't tested them. You found out that women have three different genetic types when it comes to weight loss. Can you explain that a little bit more?

Dr. Sam Shay: Sure. Let me just linger a bit on the emotional side because we're talking about genetics, but we can't separate emotion from genetics. How you feel changes your epigenetic expression. Additionally, with genetics, knowledge is power. One of the frustrating things about dealing with one's health issues, whether it's weight that you can't get rid of, aside from cosmetic points, with this current society's standards, there's the health realities of carrying excessive weight.

Dr. Sam Shay: By learning about one's genetics, now, all these keys can be unlocked instead of hating oneself. It was like my joint pain. I just couldn't understand why I was in so much joint pain, and nothing I was doing was working. Then, when I got the knowledge, suddenly it all opened up. What I described, my joint pain, directly relates to the first of the three weight gains. The first one's inflammatory water weight gain. The second one's hormonal toxic weight gain. The third one is caloric fat weight gain. That's the one that most people think of where calories in, put weight on.

Dr. Sam Shay: That's actually the least common pattern I see in people who are struggling with weight, who want to get their genetics done. The most common is the inflammatory water weight. The inflammatory water weight is the following. People have these inflammatory genes. The 15 to 20 are the major, major, major ones. Some people are way pro-inflammatory compared to others, so people can either initiate inflammation more rapidly, propagate or perpetuate it longer, or they have trouble extinguishing it.

Dr. Sam Shay: I have level three, lucky me. Why does that create weight for some people? Well, I'll use the muffin test as an analogy. This is what I actually lectured on at the Genetics Conference in New Zealand when I went into this really deeply and was invited to speak on this. The muffin test is if you take a muffin, and some people listening to this, many of you will have the experience of as you eat a muffin or half a muffin, and then you put on one, two, three or four pounds in one day. Just in that one day.

Dr. Sam Shay: You just suddenly balloon up one to four pounds. Now, that muffin didn't weigh two or three pounds, unless it was last year's re-gifted Christmas fruitcake. That's the only circumstance where the muffin's going to weigh two or three pounds. What happened? That muffin triggered this massive wave of inflammation in the body, whether it's the ingredients, the gluten, the conditioners, the sugars, the chemicals, whatever it is. The body has an inflammatory response to toxic chemicals. If you have a genetic over exuberant response, you create a lot of inflammation.

Dr. Sam Shay: What does inflammation do? It's retaining water in the body. Retaining water in what's called the interstitial fluids. Retaining water in order to do what? Dilute the toxic inflammatory chemicals from damaging your cells and tissues, and to buy the liver and kidneys time to filter out the toxic inflammatory chemicals.

That's why you can swell up. Then over time, it gradually recedes because you swell up to dilute the toxic inflammatory chemicals triggered by the proverbial muffin. Then in time, your liver and kidneys struggle slowly, slowly, but eventually remove the inflammatory chemicals.

Dr. Sam Shay: That's this inflammatory water weight. Now, it doesn't have to just be from that muffin. It can be from overexercise, and that's a real mind trip. You want to talk about demoralizing. You have this group of people, men and women, I've worked with both, that the more they exercise, the fatter they get. I mean, that is demoralizing. I think I found the reason why. It's because when I run their genetics, at least on the people I've worked with, they all have the same pattern.

Dr. Sam Shay: They are massively pro-inflammatory. Then when they over exercise, it triggers inflammation. There's this point, this invisible line that's crossed where exercise transitions from anti-inflammatory to pro-inflammatory, and suddenly they start putting on water weight from over exercising. That's the first one. The second one, it can be paired with the first one. The second one is called hormonal toxic weight. This is where you have trouble detoxing. There's genes for detox in the liver. There's eight major ones.

Dr. Sam Shay: Four of them are directly tied, possibly five are directly tied to estrogen detox. So when people have these genetic problems, variants, they're not able to detox estrogen fast enough and then they develop estrogen dominance. It's not just like you have the genes and suddenly, you're estrogen dominant. It doesn't work like that. You have to have the environmental triggers, so I look for, "Do you have exogenous or external sources of estrogen affecting you?"

Dr. Sam Shay: Your audience has probably heard this list before. It's like microwave plastic, bad makeup, certain insecticides, pesticides, growth hormones injected into certain meats in certain countries, soy products, makeups, body lotions, et cetera. There's things out there. I said plastic, petrochemicals and all sorts of stuff can mimic estrogens, so you have the external exposure, but then the inability to get rid of it. That's what creates the estrogen dominance. What happens is that, especially when they're combined, the inflammatory weight gain and the hormonal toxic genetic weight.

Dr. Sam Shay: For a man, this is one of the two case studies I presented at one of the conferences, both of these men were large, overweight and had chronic joint pain. The more they exercised, the more pain they were in, the more they put on weight and they both had manboobs. Now, I presented at the Genetics Conference on this phenomenon, not because I have some weird fixation on manboobs, I'm just observant. I was like, "Huh?" The more they exercise, the fatter they get and the more pain they are in. That sounds hyper-inflammatory, but they also have manboobs.

Dr. Sam Shay: I wonder if they also have the hormonal toxic weight pattern where they're not able to get rid of the estrogen, and I wonder if it's related, the inflammation and the weight, is it related? I ran the genetics, and sure enough, their caloric burning genes were near perfect. They had no problems burning calories. It was their inflammatory genes and their hormonal detox genes that were a mess. They were told by all their other clinicians and their friends and family, and shamed by their GPs or whatever, "You need to exercise more and eat less. That's why you're so fat."

Dr. Sam Shay: That was the exact wrong thing for them to do. One guy had six out of the seven or eight sources of external estrogen. I pulled them off, all of those, put them on anti-inflammatory liver supporting antiestrogen diets, lifestyle, supplements, et cetera. Got them to slow down their exercise to not exercising every day, but to walking every day and high intensity interval training limited twice a week. One gentleman lost 40 pounds in one month.

Dr. Sam Shay: Now, he had a lot to lose. I have people listening like, "Oh my God, I'm going to lose 40 pounds." No. No. No. He had a lot to lose, and he was set up perfectly. He actually did what I instructed. He was ready. He had the right mindset. All these factors came together. The other gentleman lost two pounds a week for 14 or 16 weeks. I can't remember, but just consistently, and the weight came off their chest. It came off their belly.

Dr. Sam Shay: What happened physiologically is that they were over-inflaming, and then the genes were over-inflaming and then the liver had to make a choice. Do I deal with the toxic acute inflammation chemicals now that are really, really dangerous, or do I have to deal with the estrogens that are there in the background and are building up that are less of an immediate problem? I ask this question when I'm lecturing to bigger audiences. I ask this to people with no medical training and people with medical training, they do not answer this question. I'm just going to ask the lay public.

Dr. Sam Shay: What do you think you would do if you were the liver? What would you choose to do, estrogen or inflammation? Every single person says inflammation. They're right. What happened is that the liver had to triage and prioritize the inflammation and then the estrogen built up, and so those man boobs were developed in the men. Now, in women, when they have this exact same genetic pattern, it's not that they develop more breast tissue necessarily. It's that their cycles go off.

Dr. Sam Shay: I had another client with that same thing, they over-exercised, found some new trainer without telling me, that was one of these super over enthusiastic CrossFit ilk, that just over trained her every day. She called me up in a panic. She's like, "I'm losing muscle. I'm putting on weight, my cycles are thrown off and they've never been off my whole life." She had the exact same pattern, high

pro-inflammatory genes, estrogen detox genes were not good, and so the same process, she over-inflamed and the liver had to make a choice.

Dr. Sam Shay: Her hormones got all wonky because her liver couldn't handle them, because it was dealing with the inflammation. Same situation with her, rebalanced her lifestyle, diet, nutrition and supplements. Muscle tone came back, water weight went away and hormones rebalanced. I had some very strong words for her trainer about cutting it down. Those are the two primary patterns that I see in genetics. The third one is the caloric fat weight. That's the one everyone classically associated with, calories in, weight goes on.

Wendy Myers: Can we talk about the liver in regards to the issues with balancing your hormones or excess estrogen, because the liver is one of the main routes for recycling excess estrogen, so many people have liver issues? 100 million people have fatty liver disease. What role does that play in your genetics?

Dr. Sam Shay: In the genetics that I run, there's one panel that checks for approximately 64 genes, the highest that are organized into the seven drivers of all diseases. We're not looking for the heart disease gene, the cancer gene, the diabetes gene, the Alzheimer's gene, the weight gain gene necessarily, or the stroke gene. What we're looking at are what are the drivers that are above all the "disease gene"? Those drivers are inflammation, the ability to quench free radicals in the mitochondria, your ability to detox in the liver, your ability to absorb vitamin D and something called methylation, which is a really big topic.

Dr. Sam Shay: The next one is cardiovascular circulation. The last one is fat and energy metabolism. Those are the seven drivers, and they're actually ranked, ordered. Inflammation controls the other ones underneath, and then the free radical scavenging controls the ones underneath, and the liver detox controls the ones underneath those. When I look at liver and genetics, I look at the eight major liver genes, three for phase one detox, five for phase two. Then I look at the genes above it. I look at the 15 inflammatory genes, the three major free radical scavenging genes in mitochondria, et cetera.

Dr. Sam Shay: The way that I organize the information is, do I see clusters? If someone has out of the eight liver genes, they've got six that have negative variants that are "red and yellow dots." I don't look for six separate lifestyle recommendations. I look for what has been shown in peer-reviewed research done on humans, not wombats or nematodes. What peer reviewed research has been done on humans to show that lifestyle, diet and nutrition has changed the expression of these rogue genes.

Dr. Sam Shay: I look for not six separate interventions. I look for the one, two or three things that affect all six of them, that are easily implemented. Out of 15 of the inflammatory genes, if they've got 10 that have negative variants, I don't look for 10 separate lifestyle interventions. I look for what's the fewest number of

interventions that affect all 10, and ideally those same ones that would also affect the liver genes in the same way. My job is to find what's the fewest number of lifestyle interventions that will affect the most number of the highest priority genes, including liver.

Dr. Sam Shay: When I look at liver, I'm looking at not just liver, but everything above it, that controls it. There's differences in what you do if they've got more of a phase two issue versus a phase one. For people listening, phase one and phase two, the way Dr. Kayla's described it is like a washer-dryer system. Phase one is where it's like the washer. You have dirty clothes. You bring them to the washer. Then you put it in the dryer. Phase two, you dry them out. If it goes from dirty, washer to dryer, you have clean clothes and you're ready to go. It's all good.

Dr. Sam Shay: If however you have a dryer that's broken, slow, backed up or overwhelmed, and you wash the clothes, but never dry them, the clothes can mold and become even worse than if you have never washed them in the first place. That's the same thing that happens in phase one. Phase one is when you take a toxic chemical like benzene. You put it in phase one. Now it becomes a benzene oxide radical, which is 100 times more dangerous than benzene was. But if you have your phase two ready, you chuck it in the dryer and you quickly glam on a sulfur group or whatever to neuter it. Then it could be put into the gallbladder and put into your intestines and pooped out.

Dr. Sam Shay: But if your phase two genes are not working, if they're not fast enough, you get this backup in phase one, and suddenly, you have all these extra strong, free radical versions of the toxins causing lots and lots of problems. When I look at genetics, the primary focus, the thing I look for first is, "Do I need to support phase two, and do I need to calm down phase one?"

Wendy Myers: Let's go into phase three, the number three cause of women's genetic weight issues.

Dr. Sam Shay: There's 16 genes in this report that look at how well you absorb, retain and burn calories as well as your ability for genes for satiation or satiety. Like, do you feel full? I've got variants on, I think, three out of four of those satiation genes, so I've always overeaten. I mean, I have the metabolism of a bumblebee, so I don't put on weight, but all the toxic inflammatory chemicals and foods I grew up with, didn't go into fat cells for me because the other side of genes that I have for burning fat for energy are very strong.

Dr. Sam Shay: Instead, all the toxins went into my nervous system, my joints and my brain leading to depression, anxiety, joint pain and insomnia.

Wendy Myers: There's a protective factor, and when people who gain weight from crackers that they eat, their toxins go in their fat, but people like you, it goes into other areas that are problematic.

Dr. Sam Shay: Correct. Yes. Thank you for saying that. When I've lectured to public audiences, I've gotten one or two snarky remarks. "Well, lucky you, you don't put on fat." I paused and said, "Now, hold on, it's all about trade-offs. It's all about trade-offs." Supposedly, lucky me, I'm very svelte in a muscular body, but the problem is I have no buffer. I have no buffer at all to toxic chemicals, inflammation, or other stuff that the body throws into the fat cells, which are the dirty closets of the body.

Dr. Sam Shay: It's the dirty closet of the body. Just shove it all in there, and when we have time, resources and the focus, we can then detox. Until then, it just goes in there. That's a safety buffer that people have. I don't have that, so where does it go? Into my nerves, my brain, my organs and into my joints. I feel it immediately. If people study Ayurveda, the Pitta Constitution, the fiery constitution of which I'm definitely one, we're mesomorphs.

Dr. Sam Shay: These ancient systems of healing didn't have the Western scientific tools, but they had these wonderful metaphors and thousands of years of observation. People with the Pitta constitution like me, they can't burn dirty food. That's the metaphor, burning dirty fuel. We get affected psychologically way faster and physically way faster from dirty food and dirty pollution, than people who can layer on fat like the Kapha body types. The fatter body types like jolly old Santa. The toxic chemicals aren't going up to their brain as readily as they are for people like me.

Dr. Sam Shay: When I look at the fat and calorie genes that people have, I look for, "Do they have the genes to control satiety, satiation?" If those are off, then we engage lifestyle changes to help them. As someone who was a former food addict, I have a lot of expertise in that part of how to help people with association. Then I look at the genes that burn fat for energy and the genes that burn fat for heat. I remember sitting in school, and the person sitting next to me actually commented like, "Can you turn it down?"

Dr. Sam Shay: I'm like, "What are you talking about?" They're like, "You are a radiator. I can feel it" I'm like, "What exactly do you want me to do about that? Wear an ice pack?" I run hot literally because the uncoupling genes are strong green dots that I just burn fat for heat quite readily. People who don't, these are people who can tend to feel cold a lot. Even if they are carrying a lot of weight, they still can feel cold. That may be a thyroid issue as well as some other things, but if people aren't burning fat for heat, this can be one reason why they feel cold.

Dr. Sam Shay: If they're not able to burn fat for energy, it may be one reason why they can feel tired, because they're not more readily able to burn an entire fuel source of fat. Some people may be thinking, "Well, this is unfair. Why is it that certain people have these genetic variants that help them do this versus help them do that?"

Well, if I come from a Northern Russia ancestry, it's pretty good for me to be able to burn fat for heat, so I stay warm in a super cold environment.

Dr. Sam Shay: Then there's the pro-inflammatory gene. Why do some people have these really terrible genetic variations where they're so pro-inflammatory? The answer is based on anthropology and is really straightforward. What is the point of inflammation? The point of inflammation is to heal damaged tissue and kill infections. Why is that relevant in anthropology? Well, if I'm a hunter-gatherer, and I go with my band of hunters to try to take down a very large animal with a tiny stick, one or more of us is going to be bitten, mauled, trampled or gored.

Dr. Sam Shay: If I have a really strong inflammatory response, what is a bite wound from an animal? It's an injection of pathogens from their teeth and saliva, and it's a tearing of flesh. What does inflammation do? It rushes in, tries to kill the infection and heal the damage. If I have a stronger inflammatory response, that means that I am more likely to survive a hunting expedition than my non pro-inflammatory hunting party members. It's all trade-offs. Even the inflammation, it's all trade-offs.

Dr. Sam Shay: We're just having to live in current society, as modern people, where there's not a lot of physical danger relative to how we used to live. There's just not a lot of physical trauma that would've necessitated having a high inflammatory gene, as a genetic advantage.

Wendy Myers: You articulated that so well. I think people tend to go with the calories in, calories out, mantra. That's how you lose weight, and people punish themselves and hate themselves. They get on the scale every morning. You articulated that so, so well. Better than I think anyone I've had on the show thus far.

Dr. Sam Shay: Thank you. Thank you very much.

Wendy Myers: It really helps to illustrate the different ways that people are challenged with weight loss. I mean, beyond what we've discussed, how are your methods different when you come to doing genetics tests or interpreting genetics tests?

Dr. Sam Shay: Very. Everyone's run into what I call 23andMe syndrome, where they just run the 23andMe, punch it through an algorithm, and then they get overwhelmed, confused and frankly a little scared of 300-health tips. There's no organization. There's no prioritization, and there's no one there to help walk you through all the changes you need to do. For one, I use a different lab. I use a different lab that has a higher accuracy.

Dr. Sam Shay: If you read the fine print of 23andMe, last I checked, they only guarantee 95% accuracy.

Wendy Myers: Oh wow.

Dr. Sam Shay: That's one in 20 genes, so really think about that.

Wendy Myers: That's pretty bad.

Dr. Sam Shay: That's pretty bad. The lab that I use is well over 99%. I've been to the lab in Australia. I can't talk about how they do it, because I made an agreement not to say anything, but it was pretty cool. They even showed me how they were able to figure out there were two different people's DNA, on the swab. They found out after they'd figured this out, because it didn't make any sense. There were two sets of genes on the swab.

Dr. Sam Shay: What happened is the mom did the cheek swab and let it air dry. She went to do something. Her toddler came by and thought it was a lollipop. He put it in his mouth, and then, "Oh, there's not much sugar on that cheek swab." Then put it back down and it air dried. She didn't realize what had happened and sent it off. So it's super accurate. That's number one. Number two is that the carb test isn't available through 23andMe because the carb test isn't checking for variants.

Dr. Sam Shay: It's not checking if it's a red, green or yellow dot. It's checking for the duplicates of a gene. It's a completely separate swab, a completely different mechanism. There's a three dimensionality to genes that not many people know about, which is the number of duplicates of a gene. Not merely is it a variant of one or the other. It's a different lab. One of the tests for carb tolerance is a totally separate genetic test that 23andMe and Ancestry don't even do. The other thing is how I organize the data.

Dr. Sam Shay: I'm only looking at about 100 genes, maybe less. These are the high priority genes that look at the drivers of diseases. I'm not chasing after hundreds and hundreds. I'm looking at the highest priority ones, and then I look at clusters. I'm not looking for interleukin six in the inflammatory gene, even though it's there. It's in that major 15. I'm not just looking at that. That's a mistake to fix it. It's like germ theory. It's like one germ, one disease. One gene, one disease.

Dr. Sam Shay: There's a whole thing that goes into these combinations of genes, constellations of genes, in clusters. I'm looking at, "Is there a pattern in inflammation as such?" It's not one specific gene I'm looking for. If there's a pattern of over-inflammation, then I can focus there on the lifestyle changes according to that pattern, just like if there's a pattern of liver detox problems, a pattern of problems of quenching free radicals in the mitochondria or a pattern of problems dealing with caloric fat genes.

Dr. Sam Shay: Is there a problem with cardiovascular, with the eight major genes for cardiovascular health? If someone's got one or two genes that are variants in the cardiovascular system, I'm really not going to be paying that much attention to the cardiovascular genes as a problem. If they've got six or seven, now, we

have a problem that I'm going to focus on. Then I organize out of all these genes that have the variants, the clusters, the priorities and then figure out what's the fewest number of lifestyle interventions that will help the most number of these genes.

Dr. Sam Shay: People don't get a list of 60 things or 100 things. They get a list of, "Here's the top 10," in rank order. I can explain exactly why they're ranked in that order, because I have a paper that shows this lifestyle change affects this gene, in this beneficial way. If this one intervention affects 12 genes, and that one intervention helps 12 genes, and then I have another intervention that only helps three genes, that 12-gene thing is going to go on top. I can rank it based on the number of citations to the genes in question.

Dr. Sam Shay: There's another specialized panel in this called vitamin D. It's a vitamin D panel, which is very important these days, as you know the importance of vitamin D. There's eight major genes between the sunlight in your blood in terms of making vitamin D and putting in those eight major genes. That journey, those eight genes can either be either a freeway, or it's dirt roads and back alleys. If people can have the mistaken idea that, "Oh, I just get some sunlight," it is not necessarily true, not necessarily true.

Dr. Sam Shay: First off, it depends on where you are in the world. Do you get UVB? In New Zealand, you only get UVB in the summertime, for three months, only between about 11:00 AM and 3:00 PM during the day. That's it, not during the other months of the year and the other times, even in the summer months. People have to have those good genes in order to create vitamin D from sunlight, assuming they have got the other cofactors and everything nutritionally to make it happen. Getting it into the blood is only half the story.

Dr. Sam Shay: Then there's getting it from the blood into the cells, and these are the VDR genes or vitamin D receptor genes. If someone is struggling, just to illustrate how important it is, vitamin D is estimated to control up to about 5% of the entire genome. I mean, that's a lot. That's a lot. Vitamin D, primarily, is known medically for helping with the immune system and with inflammation, not just bone stuff. I mean, it's no wonder vitamin D is such an important issue these days, with inflammation and infections.

Dr. Sam Shay: If you don't have the genes to reliably make sunlight into vitamin D, then you need to know that, and then you need to know if you've got problems with getting vitamin D into the cells. What lifestyle changes can you make to get the vitamin D from the blood into the cells so they actually can do their work? The other genes I look at are food intolerances. Is one genetically at risk for gluten, celiac or lactose? I already mentioned the coffee inducing anxiety and depression genes.

Dr. Sam Shay: Are they genetically vulnerable to histamines? Are they genetically vulnerable to salt in terms of high blood pressure? There's many factors that go into blood pressure. Salt is just one, so this is just looking at that one factor out of many that goes into blood pressure. Then the last one is alcohol. What is their relation to alcohol through their genetics? Are they more likely to develop addiction to alcohol, or are they prone to have very rapid onset problems when they drink alcohol?

Dr. Sam Shay: Are they getting flushes or feeling super unwell? The people that are green dots in their ability to consume alcohol, they have a much higher risk for developing alcoholism, because they don't feel the immediate negative effects of people who develop these flushes and other problems. Then, of course, there's the carb tolerance portion, which is, I think, one of the most important parts. If you can genetically figure out this aspect of your diet from here on out, are you in the keto realm, the paleo realm, the Mediterranean realm, shades of gray of that or the high starch realm?

Dr. Sam Shay: That has effects for the rest of your life, for every meal you eat from here on out, so I customize. Look, there's the official reports with all the jargon and kind of the alphabet soup of all the gene names. What I would do is I take all the official reports and customize them down into someone's personable, actionable, prioritized report. They have their personal genetic Rosetta stone, that they can now just use and know, "It can do this, this, this, this, this, and this."

Wendy Myers: I love that, because that's a problem, I think, with a lot of genetics tests. There isn't a really viable, well interpreted action plan. I don't think it can really be done by a computer, because it's so complicated, how all the genes interact with each other. I think it takes a human for the most part, to interpret the genetics and create this action plan. I think that's fantastic.

Dr. Sam Shay: Thank you. I've had many people come to me with 23andMe syndrome, and just be overwhelmed, confused and also scared. People don't know what genes are the highest priority, but they think, "Oh my God, this gene's at risk for this, this, this, this, and this." They don't realize that that's true if your inflammation genes are not behaving well. That gene you're worried about is actually way downstream. Going back to the original discussion around the emotions and the self-hatred and the shame.

Dr. Sam Shay: Even just understanding that, "Okay, I'm an over-inflamer genetically," that makes total sense from a hunter-gatherer point of view. I no longer hate my genes, hate my parents for that, or whatever. I'm not in this kind of, "Oh my God, I'm flawed, deeply flawed in some irretractable way on the gene levels." Like, "I have the genes that are adapted for a specific situation," same thing with hormonal and estrogen detox. My theory is that why would you want to limit estrogen detox genetically?

Dr. Sam Shay: Well, in periods of feast and famine, particularly the famine bit, hormone production can get shut down if calories are a deficit, as was frequently the case in a hunter-gatherer situation.

Wendy Myers: A lot of women, they go keto or super low carb, and their hormones just get totally shocked, and they're like, "What's going on?"

Dr. Sam Shay: Exactly.

Dr. Sam Shay: Maybe it might have been a genetic advantage to just have a certain section of the population retain more estrogen than other people, despite the exact same climate environment and food availability. You never knew, if in order to propagate the genes into the next generation, you just needed that extra insurance. I mean, extra estrogen floating around. Same thing with the calorie-fat retention. If I have genes to put on fat, that makes a lot of sense in environments where you are at risk for ongoing periods of famine. You can carry weight around your belly, which is the center of your mass, leaving your hips and shoulders free to walk very long distances, to forage in other areas or to sprint short distances, either away from something or after something.

Dr. Sam Shay: Sumos, they're very fast at very short distances. They're extremely fast. You can still put weight on, even a lot of weight around the belly, and be able to walk long distances to forage for other food, to hunt or to get away from a tiger or something. Even the weight gain genes make sense evolutionarily as part of, "Let's have insurance by having some people with these genes and some people without these genes, some people with this and da, da, da, da."

Dr. Sam Shay: It's all just about trade-offs. It's always about trade-offs and ensuring there's enough variability in the population to ensure the next generation will survive.

Wendy Myers: If someone listening is curious about their genes now, and what their genetic type is, how does somebody work with you to figure all that out?

Dr. Sam Shay: Sure. They just go to my website, drsamsahy.com, D-R-S-A-M-S-H-A-Y. That's S-H-A-Y.com. There, they can schedule a chat with me at the time of this recording. I'm happy to chat with people for 15 minutes at no charge for a health strategy call. I also have a free ebook on my website. It's an ebook I wrote on genetics. It's really short. It's just a really nice looking PowerPoint slide. It's saved as a PDF that walks through this entire thing in much more detail and some graphics. It even has a little picture of a muffin, half eaten, on one of them.

Dr. Sam Shay: It's slide number three, I think, two, three or four, whatever, something like that. If people want to get really granular, review this and see more detail on the genetics, that's what the ebook is for. If they're feeling like they really want to

just get started, they can talk to me and see about what the different options are for people for doing their genetics. Normally, people just do fresh swabs to go to the other lab that I use in Australia. Then I get the results back, which takes about a month turnaround.

Dr. Sam Shay: It's a little bit longer because there's problems currently at the time of this recording with USPS sending out stuff to Australia, because of various issues with what's going on in the world. In general, it's like a month or so. I get the results back and then I put a whole plan together, we do a report of findings and we go over your Rosetta stone, your specific genetics and exactly what to do regarding diet, lifestyle, supplements, exercise, food intolerances, what goes on with vitamin D. I just walk through it all.

Dr. Sam Shay: You've got your own personalized, customized report for life, because genes don't change. I mean, unless I'm silly enough to inject CRISPR, but your genes don't change. Whatever people invest in now, in their genes and their health, just amortize that over the next however many decades you plan on living. It is a pittance. It is nothing to invest right now in proper genetics analysis for the gains you get amortized over the next several decades.

Wendy Myers: That sounds just completely life changing, especially for anyone that's struggling with their weight or just feels like they're a hamster on a wheel. I know so many women that are waking up at 4:35 AM in the morning, going to do punishing high cardio.

Dr. Sam Shay: Punishment.

Wendy Myers: High cardio, aerobics, they're foregoing sleep and thinking that they're going to make some miracle happen with their body. If that sounds like you, I urge you to work with Dr. Sam Shay and figure out what your genetic plan is. At some point, you have to just allow it, instead of trying to force your body into submission. Trying to push this rock up a hill. It's much smarter to have a plan based on your genetics.

Dr. Sam Shay: I want to add one asterisk to genetics testing. I just want to give people a reality check on genetics. Genetics testing changed my life. It's changed life with the people I've worked with, but I want to give an asterisk to give people a reality check. If you do genetics testing, you implement all these different things and you're not getting the changes that you are looking for, that's when you look at functional testing. Is there a hidden gut infection?

Dr. Sam Shay: Is your immune system just going haywire on something else that's going on your body? Is your thyroid off? Are your adrenals off? Is your mitochondria itself? Are you missing key amino acids, key fatty acids? Do you have some heavy metal toxicity? Do you have these other things that genes don't tell you like what your vitamin D level is now? They don't tell you what your adrenal function

is now. They're different windows. Genetics testing is not exclusively the one and only magic bullet. It's not that. It is not that.

Dr. Sam Shay: It is a major component of a whole health picture. If people are doing genetics, they've gotten a proper analysis and after a couple months, you're not seeing the changes that you're wanting to, you have to look at these other lenses. I'm not saying genetics is the one and only thing. I'm saying it's a major piece that people have been missing. Even if this piece doesn't work to the level you're wanting, then we have another window to look at as well.

Dr. Sam Shay: Then once the functional piece is cleaned up, then the changes recommended from the genes are unobstructed and then you can gain the benefits from the genetics recommendations going forward.

Wendy Myers: Fantastic. Thank you. Thanks for clarifying that, because genetics are static, and they don't represent active things going on like your vitamin status, active infections and things like that. It's very good to clarify that. Well, Dr. Shay, thank you so much for coming on the show. Everyone, thanks so much for tuning in every week to the *Myers Detox Podcast*, where I try to bring you really important information and tools to help you live your best life. To help you gain the health that you deserve and the joy that you deserve, also.

Wendy Myers: Thanks for tuning in. I'm Wendy Myers at myersdetox.com. I'll talk to you guys next week.